MARINE SKILL REPORT SUBMITTED TO THE
UNIVERSITY OF HAWAII MARINE OPTION PROGRAM

Habitat Survey of Lobster Fishery in the Northwestern Hawaiian Islands.

DURATION:

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PROJECT LEADER:
Raymond C. Boland

ADVISOR:
Frank Parrish
Insular Resources
National Marine Fisheries Service

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ABSTRACT

The project's main aim was to compile a survey of the bottom habitat of Panulirus marginatus and Scyllarides squamosus in the Northwestern Hawaiian Islands Fishery at Necker Island, Maro Reef. and Lisianski Island.

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Introduction

The lobster fishery in the Northwestern Hawaiian Islands has been studied very closely for the past five years. This study consisted mainly of animal catches made by the National Marine Fisheries Service using a ship and some lobster traps during the summer months. This method was very successful at catching many specimens in a short amount of time. However, very little study had been done on this fishery's bottom habitat, which is very closely linked to the lobsters.

This drought of information was broken by Frank Parrish of the National Marine Fisheries Service in June - July of 1990. Mr. Parrish did a bottom survey of the habitats off of three main sites in the Northwestern Hawaiian Islands using divers. Much information was collected, and the need to repeat this method arose. In June - July of 1991 the project was executed.

Frank Parrish decided to work with as many of the original divers as possible. This way the data were collected in the same manner as it had been previously. Mr Parrish contacted me in May 1991 to see if I held an interest in the project. The reply was positive and I was signed on to work with Mr. Parrish and his project.

Materials and Methods

Dive gear was provided by either the National Marine Fisheries Service/National Oceanic and Atmospheric Administration or the diver. In my case the gear was personal. Survey gear, boats and other accessories necessary for this project were supplied by NMFS or NOAA.

The methods used for surveying was done in two ways.

1) Drop diving. A drop dive consisted of a team of divers dropping to the bottom and doing a quick survey in the vicinity of the anchor. Bottom samples of algae and sediment were taken. Photos of the bottom were also taken as well as a quantitative survey of the bottom's percentage cover in coral, sand, rubble and algae.
2) Tow boarding. Tow boarding consisted of a buddy team being towed behind a whaler for approximately 25 minutes using SCUBA gear and specially built tow boards. Recordings of the bottom and its life were done using a video camera mounted on one sled, and a still camera and a slate to record observations on the other.

Personal Project Report

My part in this project was that of a diver to conduct surveys of the bottom habitat. My involvement in this project stemmed from previous work with Frank Parrish and this project last year. Mr. Parrish needed divers to do bottom survey work and contacted me to see if I was interested. Since I had a strong interest in the project's work last year, I agreed to work with him once again. The experience I gained from last year's project was unparalleled from any other job I had done and I hoped it to be so again.

The specifics of my job were this: I was to be a diver where I would make surveys of specific areas in the fishery. The surveys were to be done in two ways. The first was via tow boarding. Two tow boards would be dragged behind a small boat. The boards would be manned by one diver each. Each board had a different role. The board I was trained to use was a still camera board. A Nikonos IV or V was mounted on the board so that it was pointed at the bottom. Additional equipment on the board was a stop watch with an alarm, bottom timer depth gauge, portable hand sonar, underwater slate, pencil and a bang stick. The other board was equiped with a video camera in an underwater housing, telegraph, bottom timer, depth gauge and bang stick.

While on the tow board, I would take a picture of the bottom with the Nikonos camera mounted on the sled every minute and a half at 25

feet off the bottom. After each photo, I would record my observations of the area using the slate and pencil mounted on the board. The tows lasted for approximately 20 to 25 minutes each, depending on the depths we were operating at.

The second method of surveying that I worked with was drop diving. The anchor would be set and divers would drop to the bottom. This method was used mainly to identify specifics, such as the genus and species of the flora and fauna observed from the tow boards. Samples were also taken of the flora and fauna in the area as well as a sediment sample. This was done by a diver using a quart jar to hold the sample. Also noted in the survey was bottom relief, bottom types and their percentages of bottom cover. Efforts were also made to locate, count and observe any lobsters in the area. The equipment I used was a clipboard, slate, pencil and bang stick. The other divers had respectively: the video camera in underwater housing to do a video record of the bottom, and a quart jar to take bottom samples along with a shark billy to chase sharks.

At the end of each dive day, the divers were expected to compile their observations and turn in the data they had recorded that day. Frank Parrish would then review the reports and ask questions about the data or observations.

Conclusion

At present, the data is still being collated on this project, and no trends have been found as of yet. Very little was known about the bottom habitat of the lobster fishery. The samples of sediment and algae are giving information that may prove importatnt to this project's conclusion, particularlly in the algae samples. The photos and video have proven their importance, especially the video, which allowed the divers to immediately review the area that they had just dove upon. This helped in improving observation skills and enhanced the data. This project's relevance is now becoming clear in it's ultimate goal in helping us understand and manage the fishery better.

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EVALUATION

This project taught me many things. In the area of formal training, I received training in the NOAA In Water Recompression Certification Program. I was also trained in the use of a Bangstick.

Experience was gained in the areas of boat handling, tow board piloting, deep diving, underwater survey techniques, bottom sampling and working with potentially dangerous animals.

The above experiences are ones I had hoped to gain in this intership. I recieved the expected experiences and more. This intership strengthened me in the area of diving experiences and personal growth.

REFERENCES

Fernandes, L., Effect of the Distribution and Density of Benthic Target Organisms on Manta Tow Estimates of Their Abundance, Coral Reefs, 1990, 9:161-165.

Kumpf, H.E., Randall, H.A., Charting the Marine Environments of St. John, U.S. Virgin Islands, Bulletin of Marine Science of the Gulf and Caribbean, December 1961, Vol. 11, No.4, pp 543-551.

Landgraf, K.C., R.P. Clarke, and S.G. Pooley, 1990, Annual Report of the 1989 Western Pacific Lobster Fishery, Southwest Fisheries Center, Honolulu Laboratory, NMFS NOAA>

MacDonald, C.D., 1986, Recuitment of the Puerulus of the Spiney Lobster, Panulirus marginatus, in Hawaii, Canadian Journal of Fisheries and Aquatic Sciences, 43:2118-2125.

Uchida, R.N., and D. Tagami, 1984, Biology, Distribution, Population Structure, and pre-exploitation abundance of Spiney Lobster, Panulirus marginatus (Quoy and Giamard 1825), in the Northwestern Hawaiian Islands, Proceedings of the Second Symposium on Resource Investigations in the Northwestern Hawaiian Islands, Miscellaneous Report Vol.1:157-198.